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the patent application

לפי הפרטים הרשומים

particulars of which are

בעמוד הראשון של

specified on the first page

הנספח.

of the annex.

היום This 02-01-2007

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ממונה על הבוחנים
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הוקדם/נדחה Ante/Post- dated	

חוק הפטנטים, התשכ"ז-1967
PATENTS LAW, 1967-5727

בקשה לפטנט
PATENT APPLICATION

אני, (שם המבקש, מענו - ולגבי גוף מאוגד - מקום התאגדותו)
I (Name and address of applicant, and, in case of body corporate, place of incorporation)

גדעון טחן מ.ז. 055048052
סרוויז'ן בע"מ 513052324

GIDEON TAHAN
SERVISION LTD.

בעל אמצאה מכח _____ ששמה הוא:
Owner, by virtue of _____ of an invention, the title of which is:

(בעברית) העברת ווידאו בסביבה עם רוחב פס דינמי ואקראי באיכות גבוהה בזמן אמת באיחור נמוך.
(Hebrew)

(באנגלית) **High Quality Low Delay Real Time Video Streaming On A Dynamic Random Bandwidth Environment**
(English)

מבקש בזאת כי ינתן לי עליה פטנט.
hereby apply for a patent to be granted to me in respect thereof.

*בקשת חלוקה- Application for Division	*בקשת פטנט מוסף- Application for Patent of Addition	*דרישת דין קדימה Priority Claim		
מבקשת פטנט from application	לבקשה/לפטנט to Patent/Appl.	מספר/סימן Number/Mark	תאריך Date	מדינת האיגוד Convention Country
No _____ מס'	No _____ מס'			
dated _____ מיום	dated _____ מיום			

*יפוי כח: כללי/מיוחד - רצוף בזה / עוד יוגש
P.O.A.: general / specific - attached / to be filed later-

Has been filed in case _____ הוגש בענין

המען למסירת הודעות ומסמכים בישראל
Address for Service in Israel

רחוב הרטום 11
ת.ד. 45205
ירושלים 91450

היום 18 בחודש ספטמבר שנת 2003
This 18 September Of 2003 of the year

חתימת המבקש
Signature of Applicant

SERVISION LTD.
513052324
JERUSALEM ISRAE

REFERENCE: סימוכין:

טופס זה, כשהוא מוטבע בחותם לשכת הפטנטים ומושלם במספר ובתאריך ההגשה, הינו אישור להגשת הבקשה שפרטיה רשומים לעיל

HIGH QUALITY LOW DELAY REAL TIME VIDEO STREAMING ON A RANDOM DYNAMIC BANDWIDTH ENVIRONMENT

Introduction:

For a long time, for achieving a good Video Streaming, a large buffer was implemented to enable a quality stream without bandwidth fluctuations. Internet based players were always characterized as "wait much time to watch well at a short time".

This characteristic pushed the market on the development of high compression ratio (CR) schemes. As CR increases, the amount of data decreases, and so, the wait time decreases also.

So market achieved solutions that reduced the user "wait time", by using a high CR, without decreasing substantially video quality, using a large buffering. Cause this we saw players as "Real Media Player", with a 30 seconds delay.

On surveillance market, we have 2 basic needs:

1- *High Quality Recording for individuals and/or occurs recognition. Playing of this media has no need of low delay from real time video.*
2- *Ultra Low Delay from Real time Video. This feature enables the policemen/ guardians/ soldiers to wait up to 2.5 seconds (under a cellular infrastructure environment) from real time video, giving them the possibility of reacting quickly.*

Why to use cellular infrastructure?
1 -There is a need of media availability to support the real time video streaming. Since today, cellular shows a high availability it will be the media preferred to use.
2- Cellular Infrastructure is one of the narrowest bandwidth available today. By achieving performance we need, at 9-28kbps on cellular, we will expect higher performances on another media like PSTN/IDSN/ LAN, etc.

Bandwidth Fluctuation
At packed-based networks, bandwidth can change from high to low and/or vice-versa drastically. It can generate effects on streaming like "fast forward" (quick show of frames) or "slow motion"(slow show of frames)

Title of Invention: *HIGH QUALITY LOW DELAY REAL TIME VIDEO STREAMING ON A RANDOM DYNAMIC BANDWIDTH ENVIRONMENT*

Field of Invention: *The Invention manages all the relevant video factors to achieve an effective balance between quality/ bandwidth/ Server and Client Resources.*

Prior Art:

Actual Solutions use large delays for streaming.

What's the Problem?

Current solutions can be useful for entertainment, where delay is not critical, and as discussed at many materials, as the compression time increases, the compression ratio efficiency can be increased also.

Drawings:

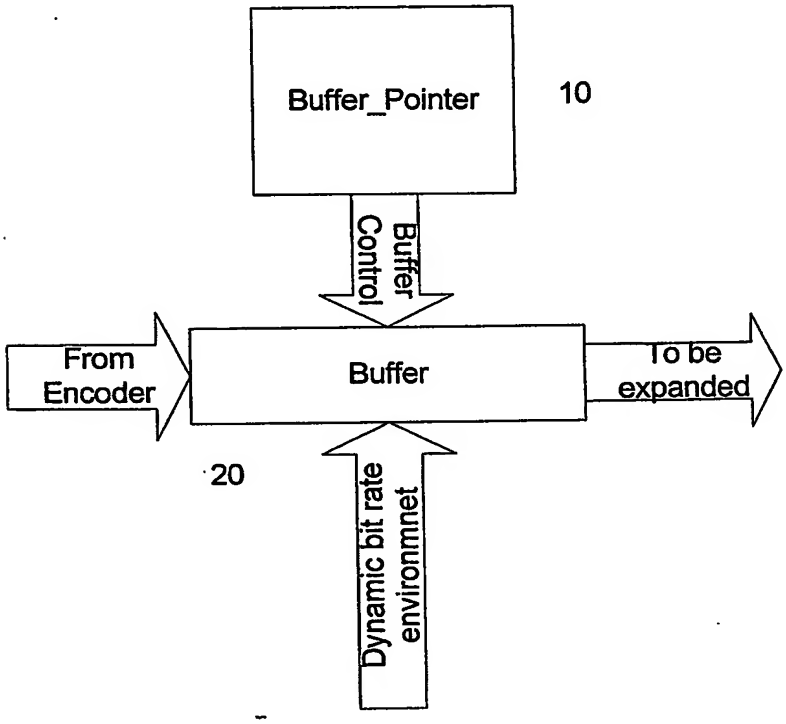

Figure 1 -Buffer Interfaces

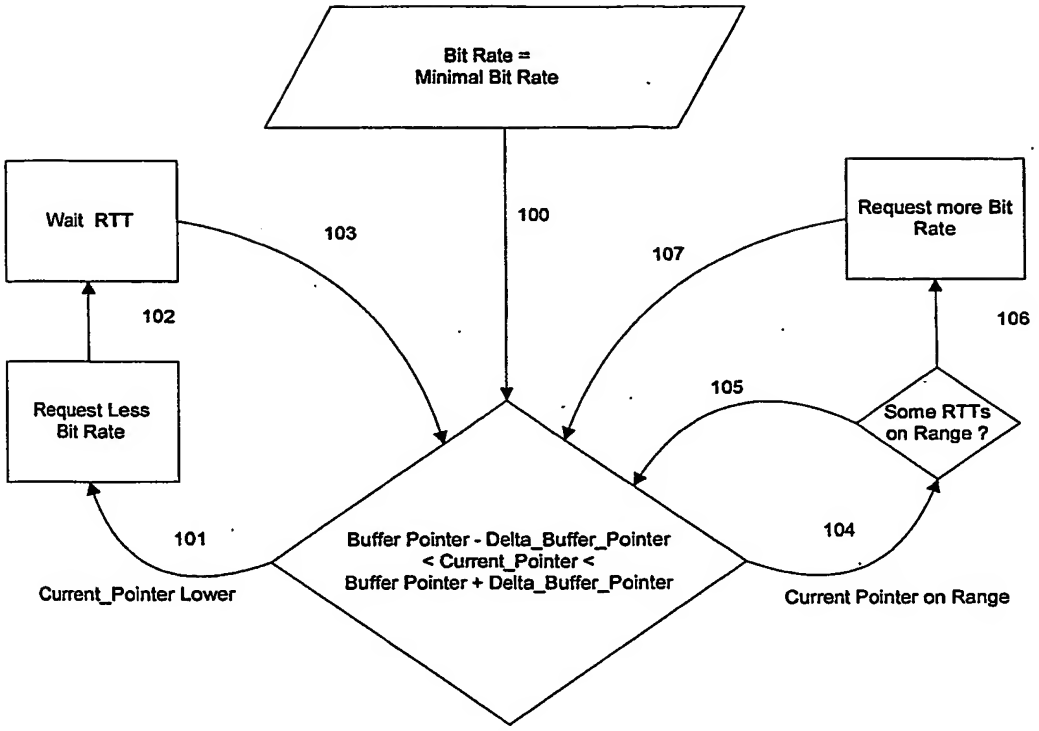

Figure 2 -Buffer Size Control

The solution is basically located on the client site. The client will be responsible for buffering the data received. The buffer used has dynamical size. As the buffer is bigger, delay will be bigger too.

Frame Rate (FR) is an user defined constant.. A delta_buffer_pointer will be defined based ob FR.

RTT –Round Trip Time – It is the time from sending a message from decoder to encoder and receiving its feedback.

The buffer acts as a FIFO (20), which its size is constantly checked, by verifying the Current_Pointer position. This size will be defined by some parameters, which main of them is bandwidth (or bit rate) available.

So, if CURRENT_Pointer (actual buffer size achieved)= BUFFER _SIZE +/- DELTA_BUFFER _SIZE, the size selected is appropriated to the instantaneous bandwidth available. On stability terms, the system can remain on this condition (processes 104 ,105).
But, as we want to achieve maximum quality if possible, if the condition remain some RTTs, a request for increasing bandwidth is sent to Video encoder (processes 106,107).

If not, BUFFER_pointer decreases, a request for reducing bit rate is sent to encoder. (101,102).

At each frame we can send a new message to encoder. However, the velocity of change is defined by the RTT. So, at each RTT we have the possibility to send a message to encoder.

Cause RTT includes some frames, bit rate prediction can be done.

Advantages of the Invention over Prior Art:

Lower Delay of 3 seconds at the place of 30 seconds. Performance increased on factor of 10.

Innovative Steps:

Optimized balance between delay/bandwidth/quality factors.

Glossary of Words and Acronyms:

FIFO- Memory organized at the First In First Out format

Fps-frames per second

Kbps-kilobits per second

References:

The MPEG-4 Book, Fernando Pereira and Touradj Ebrahimi, ed. IMSC press, 2002.

CLAIM

1. A method for generating low delay video streaming, the method including the following steps:

-Receiving from the User the frame rate (FR) desired.
-Frames are received at buffer.
-Buffer size is defined by current pointer variable
-If current pointer is at the correct range the bit rate use is appropriate to FR.
-If this condition remains over some RTTs, decoder requests from encoder more bit rate.
-If current pointer is out from range, decoder requests from encoder less bit rate.
-Each request is done after at least 1RTT.

Background Questions For The Inventor(s)

(NEEDED TO FILL OUT THE REQUIRED FORMS)

The INVENTORS are defined as the individuals that provided a SOLUTION to a specific PROBLEM. It is preferable that the leading inventor will answer the questions.

I. General Questions About Inventors:

1) Who is/are the inventor(s)? For each inventor, give full name, work location, telephone number, email address, the date the inventor started to work at SERVISION (at least month and year), home address, home mailing address (if different), country of citizenship (or countries of citizenship, if there are more than one), and manager's name.

Name of Inventor	1) Dimitry Kratzov	2) Gidon Tahan
Work Location	SerVision	SerVision
Work Number		
Work E-mail	dimak@servision.net	gtahan@servision.net
Start Date at SERVISION	March 2002	March 2000
Home & mailing address	Rishon LeTzion	Klanimus Kalman Jerusalem, Israel
Country of Citizenship	Israel	Israel
Manager's	Gidon Tahan	Gidon Tahan

2) If there are more than one inventors, what did each inventor contribute to the invention?

Inventor 1: **Design and implementation**

Inventor 2: **Ideas and consulting.**

3) Are there inventors who do not work at SERVISION today? If so:

a) Who are they?

b) Where do they work now?

c) Did they at work at SERVISION at any time during the conception or implementation of the invention?

d) If so, what are the dates that they started and stopped working at SERVISION?

II. History of the Invention:

[The idea here is to let the Attorneys know how the idea developed and at what stage of development the idea is today. The questions below should be answered very briefly.]

1) What is the current stage of the idea? Select one: Concept _____; Analysis ____; Design _____; Prototype _____; Bench Test/Alpha Test _____; Pilot Run/Beta Test _____**X**_____; Commercial Production _____.

2) Conception of the idea:

a) When did the inventors get the idea for the invention (approximately, if the exact date is not known)? **June 2000**

b) Where did this happen? **SerVision**

c) Where there any non-inventors present when the idea was created? **No**

d) If so, who?

3) First sketch or drawing: **August 2000**

a) When was the first sketch or drawing of the idea made? **SerVision**

b) Who made it? **Gideon Tahan**

c) If you have a copy of the first sketch or drawing, please attach it.

4) First model or prototype: **August 2000**

a) Was a model or prototype of the idea made? **Yes**

b) If so, when was the model or prototype completed? **April 2003**

c) If this is being done now, when do you expect to complete the model or prototype?

5) Alpha testing:

a) Was the idea alpha tested? **Yes**

a) Who performed the alpha test? **Gideon Tahan**

b) When was the idea alpha tested? **Feb 2003**

c) Apart from the inventors, who else was present during the alpha testing of the idea? **None**

d) Where was the idea alpha tested? **SerVision**

6) Beta testing (at a customer site or partner site):

a) Was the idea beta tested? **No**

e) Who performed the beta test?

f) When was the idea beta tested?

g) Apart from the inventors, who else was present during the beta testing of the idea?

h) Where was the idea beta tested?

7) Has the idea been produced commercially? If so, when, how many units were produced (approximately), by who (that is, who was the manufacturer), and for who (that is, who was the customer)? **No**

8) Does this invention impact the project you are working on? **Yes.** If so:

a) How does the invention impact on your project? **The invention enabled the system to show a low delay streaming without loosing Video quality.**

b) How would you categorize the amount of the impact on your project?

VITAL [ ] IMPORTANT [**X**], or HELPFUL [ ]

(REMEMBER, A PATENT DOES NOT NEED TO BE AN INVENTION OF A TOTALLY NEW INDUSTRY. IT SIMPLY NEEDS TO BE SOMETHING NEW THAT HAS SOME TECHNICAL OR COMMERCIAL VALUE. SMALL OR MODERATE IMPROVEMENTS MAKE UP THE VAST MAJORITY OF ALL PATENTS, AND HIGHLY REGARDED BY SERVISION.

)

c) Why did you pick that category for the impact on your project?

Because this feature set our company, (Servision) as leader on Video Surveillance streaming.

9) *Apart from any impact the invention may have on your project, does this invention impact the Company's technology in general? No. If so:*

c) Why did you pick that category for the impact on the Company's technology?

10) Prior Practice:

a) Was the invention practiced before in SERVISION? If so, describe the circumstances? **No**

b) Was the invention practiced before at some place other than elsewhere? If so, describe the circumstances? **No**

c) Have you seen this solution in writing in the professional media? **No**

d) Have you performed a patent search? **No** If so, did you find any patents that were relevant to the invention (even if they weren't exactly the same)? If so, what the numbers of those patents? (Attach copies of whatever relevant patents you have.) Even if you have not performed a patent search, have you seen this idea described in a different patent?

e) Have you seen a similar idea described anywhere else? **No** If so, under what circumstances? (That is, a competitor's product, an advertisement, a trade show, etc.)

f) Do you have regular access to trade magazines, technical articles? Do visit trade shows, or do you get trade show information from other people? **Yes**

g) Where did you get the idea? **At work**

III. Contacts with Outside Parties:

1) Up to the date you fill out this form, did you or anyone else you know of ever discuss the idea of the invention or the invention itself with anyone outside of SERVISION? **No**. If so:

a) With whom outside of SERVISION?

b) When?

c) Where?

d) What were the circumstances? (Discussion of idea, or product demonstration, or market research, or testing, or joint development, or offer to sell, or sale, etc.)

e) Were samples supplied?

f) Were written drawings or diagrams supplied?

g) At the time of each such contact with an outside party, did SERVISION have a Non-Disclosure Agreement between SERVISION and the party? If so, do you have this Agreement or do you know who does have the Agreement? (If you have it, please attach a copy.)

2) Did you or anyone else at SERVISION make an oral or written offer to sell? If so, please describe this offer, including name of potential customer, price offered, result of the offer, etc. **No**

3) Do you or anyone you know of plan to discuss the idea of the invention or the invention itself with anyone outside of SERVISION within the next six (6) months? If so, what will be the circumstances of this discussion? (Again, include any planned discussion, demonstration, market research, testing, joint development, offer to sell, intent to sell, etc.) **No**

4) Up to the date you fill out this form, was the idea ever published publicly? **No.** Does the idea appear in any SERVISION promotional literature? Does the idea appear in any article or paper that was published? Was the idea ever presented at a trade show?

5) Up to the date you fill out this form, was there ever any other public announcement or other revelation of the idea of the invention or the invention itself? **No** If so, when and under what circumstances? (An article, a trade show, a meeting, etc.)

6) Do you know if anyone is planning any public announcement or other public revelation of the idea of the invention or the invention itself over the next six (6) months? **No** If so, when and under what circumstances?

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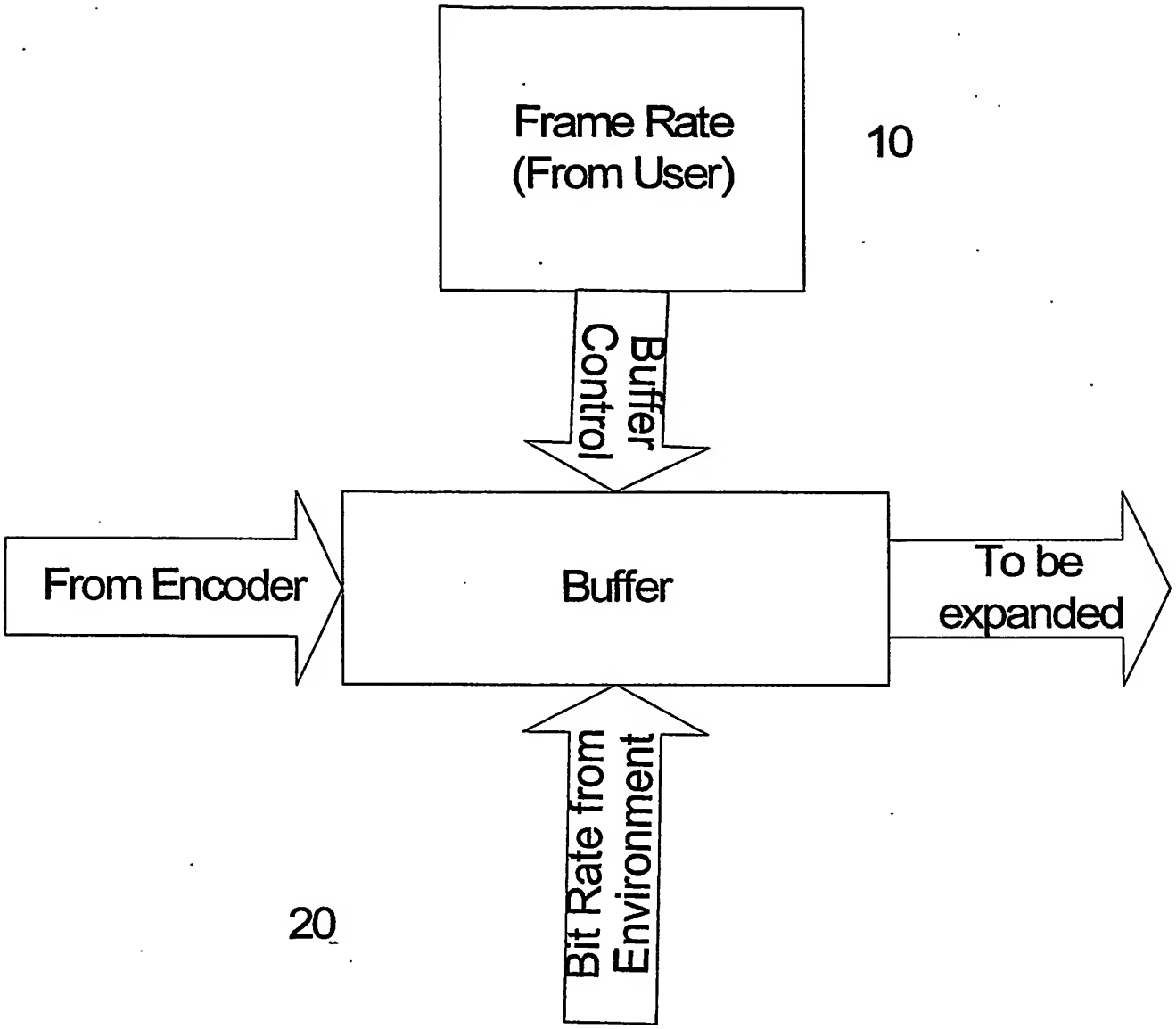

Figure 1 -Buffer Interfaces

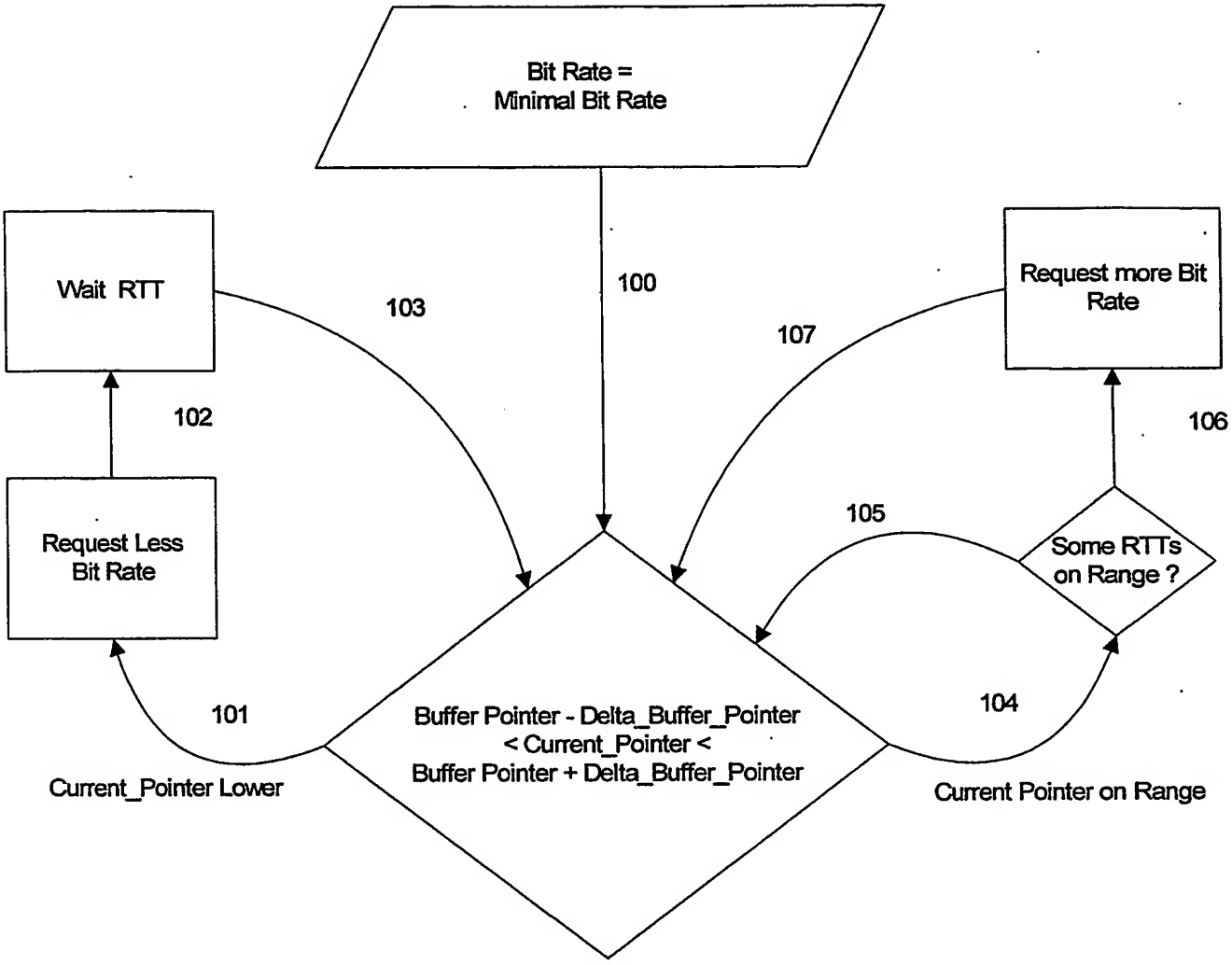

Figure 2 -Buffer Size Control

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